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10/826,151	04/16/2004	Penelope E. Haxell	1-23-8	8593

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Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
Fairfield, CT 06824

EXAMINER

GARCIA, LUIS

ART UNIT	PAPER NUMBER
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2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/826,151

Applicant(s)

HAXELL ET AL.

Examiner

Luis F. Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-4, 6-8 and 14-17 are rejected** under 35 U.S.C. 102(b) as being anticipated by Darcie (US 5,559,624).

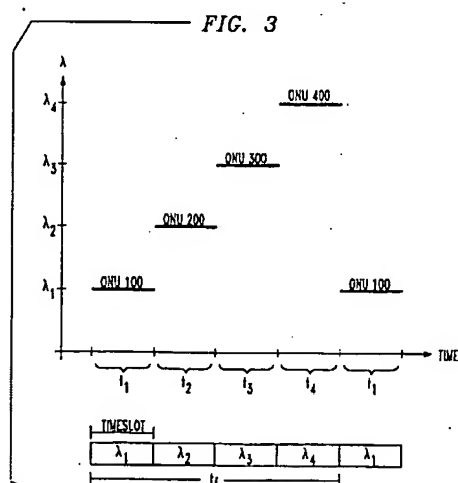
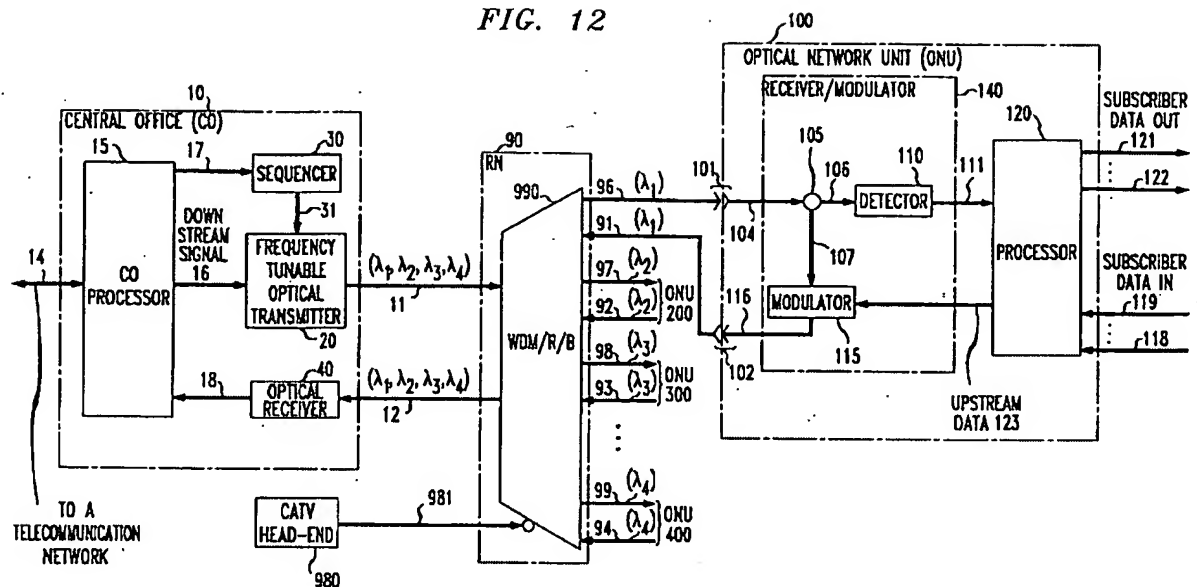


FIG. 12



2.

Regarding claim 14, Darcie discloses a time-domain wavelength interleaved network (col4 ln50-54: time-segmented wavelength division multiplexed network), comprising:

a plurality of nodes (FIG. 1 (100-ONUs)), including a hub node (FIG. 1 (10-Central Office)), wherein substantially all communications in said time-domain wavelength interleaved network pass through said hub node (FIG. 1 (10-Central Office)) in which substantially all the communications of the network pass through the Central Office (hub node)).

Regarding claim 15, Darcie discloses time-domain wavelength interleaved network of claim 14 as applied above.

Darcie further discloses where a transmission and reception of a message are synchronized such that a message sent in a time-slot k by a node Ni is received by a

node N_j in said time-slot k (**FIG. 3 and col4 ln50-67 in which a message sent by node N_i in time slot k is received by node N_j in time-slot k , e.g. the downstream signal is a time-segmented wavelength division multiplexed signal).**

Regarding claim 16, Darcie discloses the time-domain wavelength interleaved network of claim 14 as applied above.

Darcie further discloses wherein said hub node imposes a timing reference (**FIG. 7 in which the hub node (e.g. Central Office) imposes a timing reference (e.g. assigned modified time slot) in order to avoid wavelength collision-col7 ln21-24).**

Regarding claim 17, Darcie the time-domain interleaved network of claim 14 as applied above.

Darcie further discloses wherein said hub node performs a time-slot scheduling without regard to a delay in said time-domain wavelength interleaved network (**col8 ln12-13 in which an alternative method of avoiding packet collisions does not rely on the time delay from the ONU (e.g. method 1-col7 ln21-24), e.g. scheduling is based on "bandwidth on demand" which does not require synchronization col8 ln66-67 to col9 ln1-12).**

Regarding claims 1, rejected as stated in claim 14 rejection.

Regarding claim 6, Darcie in view of Hill disclose a method for communicating performed by an interior node in a time domain wavelength interleaved network having a hub node (**FIG. 5**), comprising:

sending substantially all communications received from said hub node having a wavelength indicating said communications is destined for another node on all branches

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outward from said hub node (FIG. 5 in which in which all communications received from the hub node (e.g. Central Office) have a wavelength indicating which node the communications are destined for, e.g. λ_1 indicates that communications are destined for ONU 100).

Regarding claims 2 and 7, rejected as stated in claim 15 rejection.

Regarding claims 3 and 8, Darcie further discloses wherein said synchronizing step is performed by said hub node (col4 ln45-54 in which the Central Office (hub node) performs the synchronizing step, via CO processor-15).

Regarding claim 4, rejected as stated in claim 16 rejection.

1. Claims 1-4, 14-16 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Masucci et al (US 6,592,272) hereinafter referred to as Masucci.

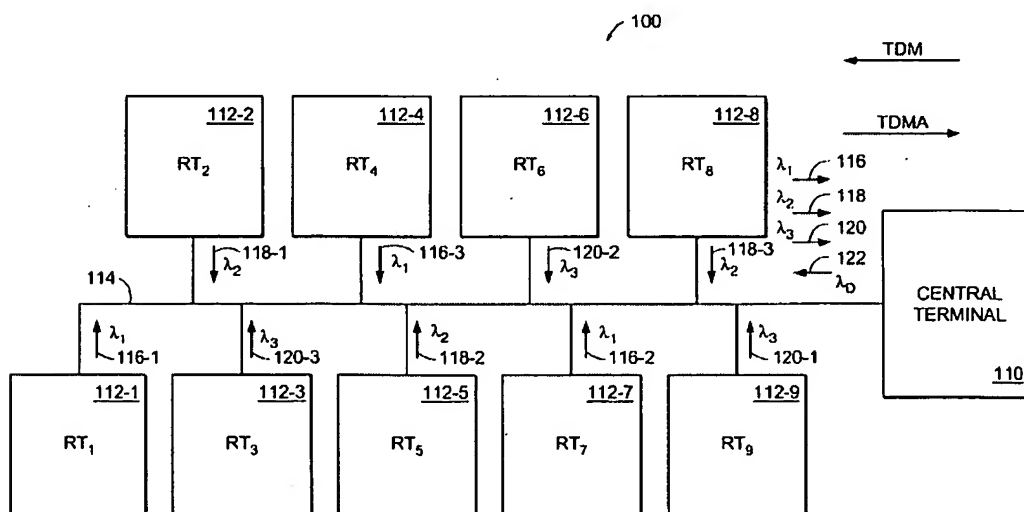


FIG. 5

Regarding claim 14, Masucci discloses a time-domain wavelength interleaved network (**col1-2 in which different wavelengths operate in a TDM configuration**), comprising:

a plurality of nodes (**FIG. 5 (RTs)**), including a hub node (**FIG. 5 (Central Terminal)**), wherein substantially all communications in said time-domain wavelength interleaved network pass through said hub node (**FIG. 5 wherein substantially all the communications passes through the Central Terminal (Hub node)**).

Regarding claim 15, Masucci discloses time-domain wavelength interleaved network of claim 14 as applied above.

Masucci further discloses where a transmission and reception of a message are synchronized such that a message sent in a time-slot k by a node N_i is received by a node N_j in said time-slot k (**FIG. 5 and col8 ln48-64/col9 ln64-67 to col10 ln1-17 in which the central node synchronizes the RTs, via synchronizing signal, so that each message is sent and received in an assigned time slot**).

Regarding claim 16, Masucci discloses the time-domain wavelength interleaved network of claim 14 as applied above.

Masucci further discloses wherein said hub node imposes a timing reference (**FIG. 5 (110-Central Node) and col9 ln64-67 to col10 ln1-17 in which the Central Node imposes a time reference via synchronization signal**).

Regarding claim 19, Masucci discloses the time-domain wavelength interleaved network of claim 14 as applied above.

Masucci further discloses comprising a plurality of said nodes interconnected in a tree configuration (**FIG. 5 and col7 ln12-14 in which a tree-branch or double star topology (tree configuration) is equally applicable**).

Regarding claim 1, rejected as stated in claim 14 rejection.

Regarding claim 2, rejected as stated in claim 15 rejection.

Regarding claim 3, Masucci further discloses wherein said synchronizing step is performed by said hub node (**FIG. 5 and col8 ln48-64/col9 ln64-67 to col10 ln1-17 in which the central node (hub node) synchronizes the RTs, via synchronizing signal**).

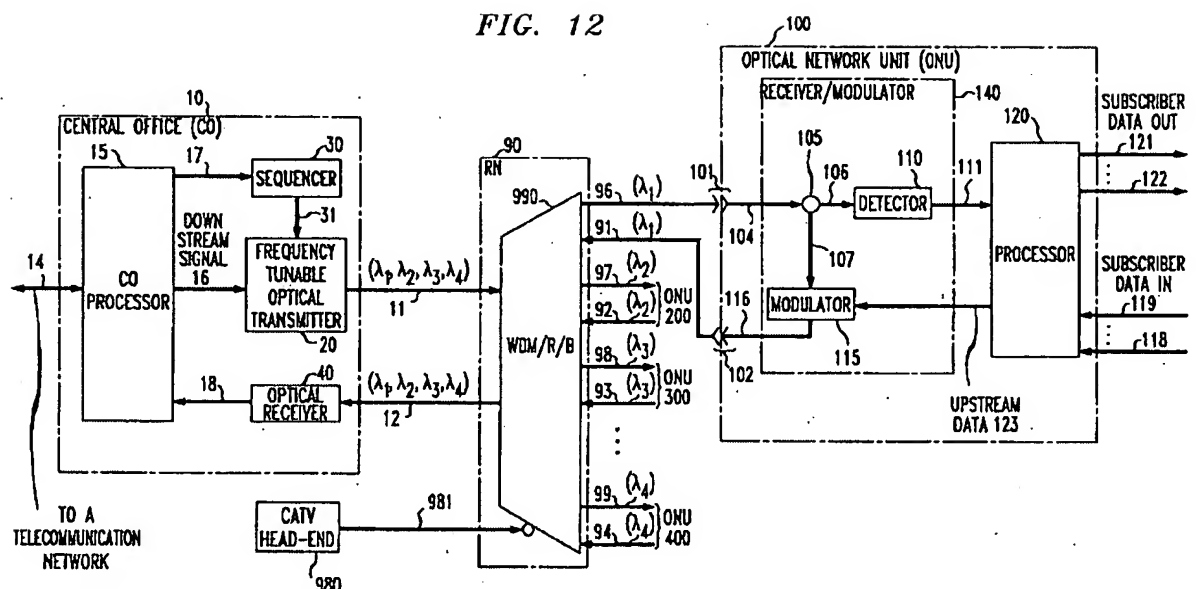
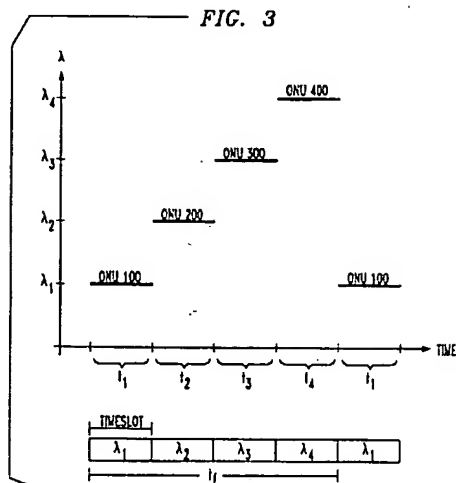
Regarding claim 4, rejected as stated in claim 16 rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 9-12 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Darcie et al (US 5,559,624) in view of Hill (US 5,963,350).



Regarding claim 9, Darcie discloses a node in a time-domain wavelength interleaved network having a hub node (col4 ln50-54: time-segmented wavelength division multiplexed network), comprising:

a laser directed toward said hub node (col1 ln67 to col2 ln1-11 in which each ONU comprises a separate laser transmitter directed toward the central office (hub node));

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a wavelength dropper for dropping signals having a wavelength associated with said node only from a fiber coming from said hub node (**FIG. 12 (90-WDM/R) in which the WDM/R drops the signals having a wavelength associated with a specific node, e.g. transmitted wavelength- λ_1 from the hub node (CO) is dropped on line-96 which is associated with node-100).**

Darcie does not expressly disclose a tunable laser directed toward said hub node. However, it is well known in the art to have a tunable laser at the ONU/customer terminals. As evidence prior art reference Hill is provide. Hill discloses a tunable laser directed toward said hub node (**FIG. 8 (81-tunable TX) and col5 ln11-17 in which customer terminal directs a tunable laser towards the hum node (e.g. Central switch node))**). The motivation for incorporate this well known concept is that it allows the system to dynamically regulate assigned wavelengths. Thereby, allowing an ONU to dynamically switch to a wavelength with better optical characteristics, e.g. better SNR, less dispersion, etc.

Regarding claim 10, Darcie in view of Hill disclose the node of claim 9 are applied above.

Darcie further discloses where a transmission and reception of a message are synchronized such that a message sent in a time-slot k by a node N_i is received by a node N_j in said time-slot k (**FIG. 3 and col4 ln50-67 in which a message sent by node N_i in time slot k is received by node N_j in time-slot k, e.g. the downstream signal is a time-segmented wavelength division multiplexed signal).**

Regarding claim 11, Darcie in view of Hill discloses the node of claim 9 as applied above.

Darcie further discloses wherein said hub node imposes a timing reference (**FIG. 7 in which the hub node (e.g. Central Office) imposes a timing reference (e.g. assigned modified time slot) in order to avoid wavelength collision-col7 ln21-24**).

Regarding claim 12, Darcie in view of Hill discloses the node of claim 9 as applied above.

Darcie further discloses herein said hub node performs a time-slot scheduling without regard to a delay in said time-domain wavelength interleaved network (**col8 ln12-13 in which an alternative method of avoiding packet collisions does not rely on the time delay from the ONU (e.g. method 1-col7 ln21-24), e.g. scheduling is based on "bandwidth on demand" which does not require synchronization col8 ln66-67 to col9 ln1-12**).

3. **Claims 5, 18 and 20 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Masucci.

Regarding claim 18, Masucci discloses the time-domain wavelength interleaved network of claim 14 as applied above.

Masucci does not expressly disclose wherein said hub node recovers from a link failure by shifting transmission times of nodes separated from said hub node by said failed link. However, it would have been obvious to one of ordinary skill in the art at the time of invention that in case of a fault, well known protection switch or redundant path

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switching will cause the distance of the path to change. Even a minor change in path length will throw off the synchronization of the system, e.g. FIG. 7 in which the ONUs are assigned a modified time slot based on each ONU's path delay. Therefore, it is obvious to re-synchronize (shift transmission times), during fault recovery in order to adjust the delay times of the time-slots, which helps avoid packet collision and data loss

col7 ln21-65

Regarding claim 20, Masucci discloses the time-domain wavelength interleaved network of claim 14 as applied above.

Masucci does not expressly disclose comprising a plurality of trees of nodes, each of said trees having a hub node, each of said hub nodes interconnected in a ring configuration. However, a ring configuration is well known in the art and equally applicable to Masucci's system, e.g. multiple Central Terminals (similar to CT used in FIG. 1) are connected to a ring; thereby allowing the Central Terminals to receive, exchange and transmit data to other parts of a network.

Regarding claim 5, rejected as stated in claim 18 rejection.

4. **Claims 20 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Darcie.

Regarding claim 20, Darcie discloses the time-domain wavelength interleaved network of claim 14 as applied above.

Darcie does not expressly disclose comprising a plurality of trees of nodes, each of said trees having a hub node, each of said hub nodes interconnected in a ring

configuration. However, a ring configuration is well known in the art and equally applicable to Darcie's system, e.g. multiple Central Terminals (similar to CT used in FIG. 1) are connected to a ring/telecommunication network (FIG. 1 (14)); thereby, allowing the Central Terminals to receive, exchange and transmit data to other parts of a network.

5. **Claims 13 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Darcie in view of Hill.

Regarding claim 13, Darcie in view of Hill discloses the node of claim 9 as applied above.

Darcie does not expressly disclose wherein said hub node recovers from a link failure by shifting transmission times of nodes separated from said hub node by said failed link. However, it would have been obvious to one of ordinary skill in the art at the time of invention that in case of a fault, well known protection switch or redundant path switching will cause the distance of the path to change. Even a minor change in path length will throw off the synchronization of the system, e.g. col4 ln13-26 in which ranging techniques are used to calculate the delay needed for proper synchronization. Therefore, it is obvious to re-synchronize (shift transmission times), via ranging techniques, during fault recovery in order to adjust the delay times of the time-slots, which helps avoid wavelength collision and data loss-col1 ln19-32.

6. **Claim 17 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Masucci in view of Darcie.

Regarding claim 17, Masucci discloses the time-domain interleaved network of claim 14 as applied above.

Masucci does not expressly disclose wherein said hub node performs a time-slot scheduling without regard to a delay in said time-domain wavelength interleaved network.

Darcie teaches wherein said hub node performs a time-slot scheduling without regard to a delay in said time-domain wavelength interleaved network (**col8 ln12-13 in which an alternative method of avoiding packet collisions does not rely on the time delay from the ONU (e.g. method 1-col7 ln21-24), e.g. scheduling is based on “bandwidth on demand” which does not require synchronization col8 ln66-67 to col9 ln1-12).**

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Masucci's scheduling technique and incorporate Darcie's teachings of an alternative time-slot scheduling technique which does not consider path delay. The motivation being that this allows the system to avoid packet/wavelength collisions without having to “range” (e.g. determine/calculate path delay) all the nodes in the network. Thereby, making transmission of data simpler and more robust, e.g. proper data transmission is not dependent on path delays that vary depending on temperature, protection switching to a longer/shorter path, etc.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis F. Garcia whose telephone number is (571)272-7975. The examiner can normally be reached on 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken N. Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LG


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER